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Gas-Light Association of the United States.

PROCEEDINGS OF THE SECOND SEMI-ANNUAL MEETING OF THE GAS-LIGHT ASSOCIATION OF THE UNITED STATES, HELD IN CLEVELAND MAY 13, 1874.

[Continued from page 187.]

Mr. Sibley offered the following resolution,

Resolved, That the report of the special committee on insurance be referred to the following gentlemen: Messrs. Williams, Leavenworth and Steele, to obtain charter forms of policy of insurance, etc., and to do all other things necessary to carry into effect the proposed system of insurance, on a mutual plan.

Mr. Steele—Mr. President, I decline to serve on that committee.

The name of Mr. Clegg was inserted in the resolution, in place of that of Mr. Steele.

Gen. Hickenlooper-Do I understand that this action is taken by the society to establish an insurance company.

Mr. Williams—This matter is to be taken charge of by this committee, and is entirely outside of tho association. That report is based upon returns from seventy-five companies or more, that desire a certain amount of insurance. The association is not in any way responsible for any of the debts to be incurred, or for any losses, or anything of the kind. It is a system of insurance on the mutual plan. The parties who engage in it are responsible among themselves for all the losses that may be incurred, and are entitled to the benefit of the profits that may be realized. The association has nothing at all to do with it, only as members of the association present, may express their opinions in favor of it or not.

Mr. Sibley—Mr. President, I will state that my object in offering that resolution is to test the sense of this convention on this important matter of insurance. I suppose there is no gentleman in charge of gas works who does not know that it is a very difficult thing to obtain insurance from regularly organized insurance companies upon gas works, and it is likewise very annoying to those charged with the responsibility of their management, to be unable to obtain insurance at popular rates. This is the first time I ever heard the mutual plan suggested. I introduce that resolution simply with a view of drawing out the members of this convention, who know more about it than I do. For my part I am very favorably impressed with the report of the committee, and I must say I feel disposed to vote for the resolution introduced. At the same time I have not fully made up my mind on it; but I should be very glad indeed to have the subject ventilated in such a way that would enable me to form, and likewise other gentlemen to form their opinions, intelligently upon the subject. I regard this as one of the most important matters that could come before this convention, and one that should be settled understandingly and carefully. The only reason I had in offering the resolution in its present shape is, that the subject might be before the convention in some shape that would induce gentlemen to express their opinions freely.

Gen. Hickenlooper—From the manner in which that resolution is worded, if adopted, it commits the association to the organization of an insurance company. If the object is merely to obtain an expression of gentlemen of the association, merely as to the plan of insurance, I would suggest that that can be done by simply inserting the words, that we approve of the plan of insurance, and let that be discussed and voted on.

The President—I hope there will be no misapprehension on this point. Certainly nothing is more clear than that if this resolution is adopted, it makes this association father the system. Mr. Williams has been at considerable trouble in getting up facts, and I understand he has a bill of $40 or $50 for expenses in doing so. Of course it would be preposterous—if you will allow me to use that word—to say this association is not made the father of the whole thing. For one I am very far from believing in the thing at all, and I hope before this resolution is adopted, a pretty full discussion will be allowed.

Gen. Hickenlooper—I move that it be amended in that way.

Mr. Sibley—I do not understand the amendment proposed.

Gen. Hickenlooper—The idea I had is this—that the resolution proposed to form an insurance company, by directing the appointment of a committee to procure a charter, etc. If it is desirous simply to obtain an expression of approval or disapproval as to the establishment of this company, that can be accomplished by asserting that this association approves of the establishment of such a company.

Mr. Sibley—I do not understand that this resolution commits the convention to any particular method or mode of organizing this mutual company. It simply instructs this committee to prepare and submit a plan of organization at the next semi-annual meeting. It does not empower them to commit this convention to any particular mode of proceedings.

Mr. Williams—I suggest that the resolution be amended by inserting the words "that the association should not be responsible for any of the expenses incurred."

Mr. Floyd—This society ought to pay the expenses Mr. Williams has incurred in this matter. He was appointed at a meeting of this society six months ago, to prepare this article, and whatever expenses he has incurred it seems to me this society ought to pay. No gas company is compelled to go into this thing, and if this society approves that document, no company need go into it unless it sees fit.

Gen. Hickenlooper-Does the resolution not commit the society to pay for the procurement of this charter?

Mr. Floyd—I think the resolution only authorizes the committee to ascertain the mode of obtaining a charter.

Gen. Hickenlooper-If it was expressed in that way there would be no objection to it.

Mr. McIlhenny—I move that the whole subject under consideration be laid on the table.

The motion was lost.

Mr. Spencer—Mr. President: I am opposed to this association going into the insurance business, just as I would be opposed to its going into the gas meter or gas pipe manufacturing business, or coal business, or any other business; for the reason that if we want insurance let us go into the market and buy it, and not complicate matters so much. If it is a mutual institution to be organized outside of the association, let gentlemen desiring to organize that institution go and organize it without its having any connection with this association. If this association has authorized the gentleman here to procure information and he has incurred expense, as a matter of course this association is bound to pay all the expense incurred up to this time; but I am opposed to incurring any further expense, and besides that, I am opposed to this association committing itself, or taking any action in regard to that matter whatever. The subject has been brought to the attention of gas companies; they know what it is: and if there are those who desire to take hold of it in their individual capacity and organize an insurance company; because if this institution is not to father it—not become responsible for it, why have it here at all? What has it to do with this association in any shape or form? I am certainly opposed to this association taking any further steps in that direction, but I am in favor of paying the expense already incurred in this matter. (Applause.)

Mr. Williams—As there seems to be some objection made to the trifling amount of the expenses incurred in this matter., I will withdraw the statement of the amount. I should rather pay it out of my own pocket than to have the matter questioned.

Mr. Spencer—I do not understand that any gentleman has said one word against paying for this thing, and I certainly did not say so.

The President—I hope Mr. Williams will not put me in a wrong light in regard to this matter. I said nothing, and intimated nothing against paying the expences that have already been incurred. It is perfectly proper that we should pay those expenses. I wish to make it clear to this convention that if we adopt this resolution, we do father this whole thing. We have to pay the expense in the first place of the preliminary examination, and then appoint a committee to carry out the scheme. Mr. Williams must not attempt, with my consent, to throw back upon us the

idea that we intend to be stingy with him. We pay all our expenses, and do not wish to be placed in a false position.

Mr. Sibley—I introduced that resolution not with a view that the chair suggests. I simply desired to know how far this convention propose to carry this thing. They originated it before I became a member of the association. That report of the committee struck me favorably, and I do not conceive that it is the intention of that resolution to commit this association, or to use the expression of the chairman, to "father this whole thing." It is merely with a view that the scheme might go on and be perfected, and be presented as a whole to this convention, to be acted upon; not that it is to commit the convention at all, but simply to perfect the whole thing, and then produce it as a whole at the next meeting of the association. That is the object of the resolution.

Mr. Floyd—I move that the report be printed and sent to the different gas companies, and be taken up at the next meeting. At that time the matter will be perhaps better understood than it is at present.

The President—The motion is not in order. Something must be done with this resolution.

Mr. Demill—It will be recollected that this association was formed by gentlemen believing that something could be done to the benefit of the gas interest at least, and especially as it related to the manufacture of gas—the best material and best mode, and all these other things come up in connection with it, that might likewise be beneficial. Among them was a resolution passed at the first meeting in New York in April, a year ago, in the following words:

"*Resolved*, That the President be requested to appoint a committee of three members, to consider the subject of insurance, and report a plan by which the insurance interest of gas companies can be better protected."

Protected how? You apply to insurance companies in any of your cities to insure your building, or purifying box, or anything else, and they will charge you 3 or 4 per cent. The gentleman has corresponded with seventy-six companies throughout the country, and companies from all parts of the country have approved of this thing; and it is so clear in that report, that it seems to me we cannot go by it. You can elect if you wish to get insured in any other company. It does not oblige you to insure in this organization at all; but we believe it will be for your best interest to insure in this company, and if you go as high as 2 per cent, you will have a surplus in one year to pay any damages you may sustain. I understand that the gentlemen getting up this plan do not ask the association to pay a dollar from this day. They merely want your approval, if you think well of it.

Mr. Steele—I find among these papers a bill of $40 for these expenses, and the vouchers for it.

Mr. De Mill—That grows out of that very resolution directing the committee to procure this very information, and they have done so.

Mr. Severance—There are two questions involved here. One is as to the organization of that company; and the other is whether gentlemen approve of that insurance. If the matter was submitted separately it might be easily determined. Now it is said here that there are 75 companies who desire to enter into this insurance. It seems to me if these 75 companies want to form this company, they ought to do it. We should say, go ahead and form this company. We do not want to do it. There is that difference in the question. We are not obliged to do it; and all that is needed to be done with the resolution is to divide it, so it shall take that position.

Mr. McIlhenny—Mr. President: This association has no legal status. Its endorsement can give it no legal force. Who would take stock in an insurance company, endorsed by this association? The company must have a charter from some authorized body. All the force this association can give to it is a moral force. If any gentlemen wish to get up our insurance company, let them apply to the Legislature, or to Congress, and then let the gas companies insure in it. There is no necessity for this association endorsing it, because over one half of them would not insure in it. If any gentlemen wish to take stock in the company formed by these gentlemen, let them; but this association cannot give them a charter, nor would their endorsement be worth two cents.

Mr. Sibley—The resolution requests them to procure a charter.

Mr. McIlhenny—Why is it necessary that the association should request them to procure a charter? Can they not procure it without?

Mr. Williams—There are 75 companies there.

Mr. McIlhenny—Very well, let those 75 companies write out a petition for a charter. This association has nothing to do with it; this association started with the object of seeking information in reference to the manufacture of gas. The question of insurance, as one gentleman remarked, is very much like the manufacture of pipe, or mining coal, or any other subject that enters into the pursuit of gas-making—a subject that this association has nothing at all to do with. I renew my motion that the subject be laid on the table.

Mr. Wood—There seems to be some mistake about these 75 companies, who have all endorsed this Insurance company. Now, we received from Mr. Williams a circular, containing certain questions, which I, myself, replied to. I did not in that reply endorse this scheme, and do not now endorse it before this association. I do not think that this association is in any shape whatever to go into the insurance business. Let these parties organize a company, and such gas companies insure with them as they can get. The resolution read by the Secretary was proposed by Mr. Williams, and with all due deference to his interest in this matter, and his very able report upon this subject, I hope this motion to lay on the table will prevail, and the motion rest where it ought to.

Mr. Sibley—I submit that the motion is not in order. It has been disposed of once, and there has been no intervening motion.

Mr. Spencer—I move that the subject be indefinitely postponed.

Mr. Floyd—Before that motion is put, I think it would be better to have it understood that the Society means to pay to Mr. Williams the expenses he has incurred.

Gen. Hickenlooper—That is a matter that has no connection with this subject at all.

The President called Mr. De Mill to the chair, and spoke as follows:

I happened to be on the first committee to consider the insurance question. This matter was brought up at the very first meeting, at which the association was organized in New York, a year ago last April I think it was. I was placed upon that committee; the committee had a meeting at the St. Nicholas, talked the matter over; and, finally, I intentionally wrote a vague report to the convention, which I read. It covered about one page of letter paper, in which I suggested that it was worthy of consideration, whether gas companies might not organize an insurance company for the insurance of holders, and other kinds of apparatus, and left the whole thing to future examination and discussion. I found that some of our leading friends East, were entirely opposed to the whole scheme, and said it would never do; the more I thought of it, the more I thought it would be utterly impossible to make a thing of that kind practicable, under the name of this association. When we met in October Mr. Williams was anxious to have a report made on it, and he will bear me out in saying—a report made in favor of it. I said we did not have the information, and was not prepared to endorse any such scheme; that what we wanted in the first place, was to get information, and then let the society consider and decide upon it, if it should choose. Finally the committee broke up—could not agree upon any report, and the result was Mr. Williams alone was appointed to investigate and report. Mr. Williams has gone on, sent out circulars, gathered up information, and has incurred some expense in doing it. He has been acting entirely under the instructions of the association, and we are all glad to pay that expense. There has been no intimation to the contrary; but there is quite a number of us who are entirely unwilling that this association should go into the business of insurance, or authorize, or give its approbation, to any particular scheme of insurance. This is a much weightier question than gentleman may think. It involves getting a charter for the whole of the United States, and commits the association to the organization of a grand insurance company, for the insurance of the gas property of the country. We bring ourselves directly in opposition to, and separate ourselves entirely from the insurance interest of the country, and set up an insurance company. It strikes me that we are running against a very fatal rock in doing this thing. The object of this association is not to organize meter companies, coal companies, or any other kinds of business; but, as our constitution says, for the purpose of diffusing intelligence on the best system of making and distributing illuminating gas. It is organized, as I said to the association this morning, for mutual improvement in these things, and not to promote any particular scheme of insurance, or any other scheme for the making or saving of money, by setting up a business.

Now I think one gentlemen who has spoken hit the matter precisely on the head, when he said—let all gentlemen who are in favor of the sentiments of this report, as many of them as please, outside of this association, organize their insurance company, obtain their charter and go ahead and ask companies to come in and insure if they like. Nobody can have any objection to that. I have no objection to that; but I do feel a very strong objection to committing this association, in any sense, to the approbation of this scheme, or any other special scheme of insurance. We have gathered the information, and we propose to pay the expenses incurred in doing it. Let companies do as they please, and gentlemen who are interested in getting up an insurance company, go ahead individually and do so, but let it be clearly outside of the association. (Applause).

Mr. Steele—I would say that the vouchers of this expenditure have been handed to me for examination. A bill of $40 has been paid by Mr. Williams; hadn't we better approve the bill?

Mr. Spencer—I think it is entirely separate from this. I will immediately after the disposition of this question, not only consent that the bill be paid, but that the gentleman be paid for his trouble.

The President—I do not think the action of the convention upon the motion disposes of the question of the payment of that bill.

The motion to postpone was put and carried.

Mr. Steele—Mr. President: Is it proper for me to introduce the subject of this bill now?

The President—It is.

Mr. Steele—The bill is $40, the vouchers are all here and I move that the bill be allowed and paid. Carried.

Mr. Walker—Mr. President: If it is now in order, I move that papers be discussed as they are read.

Mr. White—Mr. President: As there are several papers yet to be read, I move that we proceed to the reading of those.

Mr. Walker—Mr. President: I move we proceed to discuss the subject of Mr. McIlhenny's paper. Carried.

Mr. Walker—I would like to ask Mr. McIlhenny a question, in reference to his arrangements, whether he uses an exhauster?

Mr. McIlhenny—I stated in the paper that I did.

Mr. Walker—Do you consider it necessary to use an exhauster to get such results as you speak of?

Mr. McIlhenny—Certainly.

Mr. Walker—Do you think such results can be obtained by doing away with the exhauster?

Mr. McIlhenny—Well, it is possible, but entirely improbable, according to my idea.

Mr, Walker—My idea in asking the question is this. Suppose we had a pressure of five inches, your seal

would at least require to be six inches to be safe. Now, make it say, five and a half inches, and by removing it a half inch you would still have five inches, and my question was—What great result would be got by doing away with the half inch?

Mr. McIlhenny—I stated in the last portion of that paper, that it was necessary for a person to thoroughly understand the principles involved in this matter, before he could comprehend it. That the exhauster stands between the hydraulic main and the purifiers, and there is no pressure on the retorts after it leaves the exhauster. Of course, between the exhauster and the holder it makes no difference what the pressure is. The exhauster draws from one side and forces on the other.

Mr. Price—How do you run your exhauster?

Mr. McIlhenny—We run it at zero.

Mr. Littlehales—I presume there is no gentleman present who has as much as six inch seal on the dip-pipes. What would be the necessity of it? Because you would not send six inches to the governor; therefore you would not want to have a six-inch pressure on the gas-holder. You would not want six inches of seal on the dip-pipes.

Mr. Walker—I assume it is six inches.

Mr. Littlehales—I presume no one would have anything like a six inch seal on the dip-pipes. I should think an inch would be ample, and therefore if that were the case, there need be but little deposition of carbon in the retorts. One reason why I find there is a great deal of deposition is, the manufacture of the retorts themselves. A retort that is well glazed will not have anything like the same amount of carbon deposit. Then again, in a retort that is kept well stopped, there will not be as much deposition in that retort as in one that has a great many holes in it. My experience is therefore, that having the exhauster about level gauge, having about an inch seal on the dip pipes, there will be very little trouble with carbon in the retorts, unless the heats are very high. I do not consider that high heats are more advantageous than exceedingly low heats, because if you have high heats you get a little larger production; but you get the purifiers fouled quicker. I would like to ask the gentleman who read the paper, What is the production of gas from coal in his works?

Mr. McIlhenny—I am very willing to state that, but I do not feel at liberty quite.

Mr. Littlehales—That would give us some idea as to the value of the process submitted to the association.

Mr. McIlhenny—I would state, however, that it is beyond five feet, considerably.

Mr. Littlehales—From what kind of coal?

Mr. McIlhenny—Well, last year we used about 75 per cent. of coal from Western Virginia, about 20 per cent from Pittsburgh, and about 5 per cent of Western Virginia cannel. The illuminating power averaged 15 7-10 candle power.

Mr. Littlehales—State how much coke you get per ton.

Mr. McIlhenny—We sold about seventeen bushels to the ton.

Mr. Littlehales—The production?

Mr. McIlhenny—The production entirely depends upon the kind of coal you use.

Mr. Littlehales—Take the coals you were speaking of.

Mr. McIlhenny—Western Virginia coal produces less coke, although of a better quality than that produced by Pittsburgh coals—about 36 bushels to the ton, and the Pittsburgh coal about 42 bushels to the ton.

Mr. Littlehales—I wish we could get Western Virginia coal. So far as my experience has been, those results are scarcely attainable.*

Mr. McIlhenny—I would state this for the information of the gentleman, that the West Virginia coal will not produce as much as the coal from Pittsburgh, and there would be no advantage in getting it.

* Mr. Littlehales means in the New Dominion. His works are at Hamilton, Canada.

Mr. Littlehales—Then if that is so, it seems to me there is a loss some way or other, if it will produce 5 feet.

Mr. McIlhenny—It produces 36 bushels to 2,240 lbs. There is a cannel coal from West Virginia—a very fair cannel—that produces about 10,000 feet to the ton.

Mr. Walker—I have understood from parties who use this or a similar process, that if they remove the seal from the dip pipes, the yield is very largely increased, even without using any exhauster.

Mr. McIlhenny—That cannot be so.

Mr. Littlehales—Anybody who understands the principle can see at once that this is a false idea, yet I understand they say so.

Mr. Walker—There is a good deal of misconception about that thing. I was looking over a few old works and I found the hydraulic main working at six inches. Something like twenty years ago my attention was directed to that, and I commenced then to remove the tar, by drawing it off from the bottom of the main, and have continued to do so ever since, and never had any difficulty with heavy tar when the liquid in the main was always kept at the same specific gravity.

Mr. Littlehale—Did I understand the gentleman to say that the tar become so thick that it is very difficult to get the gas through it?

Mr. Walker—Yes, sir; I say that.

Mr. McIlhenny—I would say that this process I have been speaking of, does not subject the gas to the tar at all, and is not subject to that objection.

Mr. Walker—I did not make that objection in reference to the McIlhenny process, I state that this is a great trouble, and a great cause of carbon in the retorts, and I said that drawing the tar from the bottom of the main, would be a means of preventing it, and that the fluid through which the gas passed remained all the time of a uniform specific gravity. Now, I am just as anxious for improvement as everybody else; but when we can make a good quality of gas, 14 or 15 candles, using Pittsburgh coal, I think it is doing very well for the old process, and I cannot see the advantage of this thing.

Mr. Littlehales—(To McIlhenny): Do you seal each retort, or each bench?

Mr. McIlhenny—Each bench.

Mr. Littlehales—That seems to be open to great objection. I believe it is very unwise for the gas manufacture, to charge the whole of his retorts at the same charge, because if you put 1500 or 1600 weight of coal in each bench, you must necessarily check the heat. If you take 2 or 3 of them, then charge 2 or 3 afterwards, to equalize the heats, you will get better results. It seems to me that the process which the gentleman submitted, is liable to the objection that you must charge all from the bench at the same time.

Mr. McIlhenny—I did not state anything about the method of doing this thing. I supposed at this time everybody understood what those details were. I will state to my friend over there, that each bench divided by divisions of the hydraulic main, was the old way of doing it many years ago. In using this process I speak of, it is not necessary to charge the retorts all at once. If you wish to do so you can do it just as well, because the seal is put on when the retorts are being charged, and removed when the retorts are charged. You seal the bench, then charge it, and after the charge has been put in, you remove the seal. The paper I read here to establish the principle of this method, stated nothing about any particular way of doing it. I was particular about that because I happened to be perhaps the first one in this country to try this thing; and since then, if I may use the expression, there has been a perfect diarrhea of schemes. [Laughter.] I only submit the matter as an argument to prove the principle involved. If any gentleman can controvert these facts, to disprove the principle involved in that paper, I would like to hear him. The simple method of removing the seal and putting it on, is a mechanical operation. It does not require any particular education to comprehend it. The principles involved, however, are a little deeper, and unless a person understands them, and knows their use, it would be folly for him to undertake it; but putting the seal on and taking it off, and putting the pipe in the hydraulic main, is very simple, and any mechanic can learn it in half an hour. I can explain that to any gentleman in 5 minutes. Mr. Walker states it can be done and the same results can be obtained without removing the seal. Now, I would like him to show upon what theory or upon what principle. Those results can be obtained with the seal on. I distinctly stated and I will state again, that carbon is produced, or rather, it sticks to the retorts, because of mechanical pressure. If any one can controvert that argument, I would like to hear him. The mechanical part of this contrivance is so simple I did not think it necessary to explain it, consequently I left that part of the detail out.

Mr. White—Mr. President: Since this discussion has commenced, I have been reviewing the experiences of the past five or six years of my life, in connection with these questions of the advantage or disadvantage of dispensing with the dip seal. Like Mr. Walker, I tried to make all the yield possible from the coal used, and with him found that my first obstacle lay in the density of the liquor in the hydraulic main. I used means to make this liquor more limpid, and gained an increased yield. My next step was a reduction in the dip-seal in the hydraulic main, from one and a half inches to one inch, and further to half an inch: these latter changes gave me most gratifying results both as to yield and quality. During these trials I had gradually increased my heats to what we now designate "very high heats," heats as nearly white as possible; also in running my exhauster, I made it a point to secure a vacuum, not merely an a gauge in my exhaust room, but an absolute vacuum at the mouth-piece of the retort—thus I secured many of the good results Mr. McIlhenny so justly claims from the application of his theory, and found my company selling a yield per ton of 10,800 cubic feet of gas of a good illuminating power. What I had done convinced me of the value and need of some process whereby the dip might be removed, and the full advantages secured, as my results were practically but a cruder way of getting at the same thing, for as I worked my exhauster actually drew the liquor in the hydraulic main down below the ends of the dip pipes, so unsealing them to all intents, but not so fully as can otherwise be obtained. In further corroboration of the principle involved in Mr. McIlhenny's paper, it was my good fortune in assuming charge of the works of the Peoples Gas Company of Brooklyn, to find a number of what is known as the Gibson Valves—another contrivance for dispensing with the dip-seal—placed upon their hydraulic mains, I am thus enabled to give the results of some actual experiments made upon this theory. In some of these experiments I had the assistance of other and more skilfull engineers, and the results obtained gave an increase of from one-third to one-half cubic feet per pound of coal, from one to one and one-half a candle gain in illuminating power, while the accumulation of carbon in the retorts was very much less than under the old method of working. It is but just to say that these experiments were carefully conducted in every respect, and that the results have been constantly reproduced, and are matters of record with that company, as they still use the Gibson Valve, I am informed with satisfactory results.

In reply to Mr. Walker's remark, that some works are producing with seal as good results as are made without seal, it can only be necessary to say that works in every way similar as to apparatus, show even greater variation in their productions, and so long as men differ and intellects vary in culture, just so long will special men produce greater results than the general man. Meaning no disrespect to the capable gentlemen who have preceded me in the charge of some works I have conducted, I have taken the same apparatus and secured many of the results claimed as being had alone from the use of appliances for dispensing with the seal; and yet subsequent experi-

ment confirms my belief that I might have done better by using some such appliance. I will close in saying that the result of my experience is, that a reduction of seal, all else remaining the same, will increase the quantity and quality of the gas produced, and that a still greater gain is obtained by dispensing entirely with the seal; so far facts justify me, beyond this arises the question as to the proper means to apply, and this being, in most of its aspects, a purely mechanical question, must find, as all such queries do, diverse solutions.

The President—I am very glad indeed that Mr. McIlhenny has relieved himself of any suspicion of advocating any particular system of removing back pressure. Some members of the association might have gotten the impression that he was advocating McIlhenny's system. I think we ought to be careful about advocating any special system. We do not wish to aid parties in selling patents, but we wish to learn the true principles upon which to run our works.

A paper on Naphthaline, was then read by the secretary, Mr. De Mill.

ON NAPHTHALINE,

By J. Herzog, Esq., Chief Engineer of the Metropolitan Gas-Light Company, New York City.

Gentlemen: Having been appointed at your last convention to prepare a paper on matters and questions appertaining to Naphthaline, one of the residual products of the manufacture of gas, I respectfully submit the following.

Naphthaline, the existence of which, according to the latest edition of the "Book of Inventions," was first proven by Garden in 1820, comes over late in the distillation of coal tar. It is a solid at ordinary temperatures, and when pure forms large colorless crystalline plates; it has a faint, peculiar odor; is unctious to the touch, and evaporates slowly at the common temperature of the air.

Naphthaline is not absorbed by water, but it is by the volatile and fixed oils, and by naphtha and coal tar; hence the advantage of keeping the raw gas until it is thoroughly cooled, in contact with tar and ammoniacal liquor, in a long hydraulic main.

Richer qualities of gas containing much hydrocarbon, do not deposit naphthaline, and hence the use of naphtha as a remedy for naphthaline in the mains and service pipes. Naphthaline is not easily decomposed by heat; it is quickly deposited by cold, forming brilliant white scales, which have a tendency to collect in the bends of pipes, and wherever there is an impediment to the easy flow of the gas.

For the gas engineer it seems most important to prevent the crystalization of naphthaline, and this it appears to me can be done by keeping the gas containing naphthaline in contact with the light volatile oils; though all the chemical properties of naphthaline are not yet discovered, it is a well known fact that naphthaline shows a great affinity for light hydrocarbons. In gas generated at a low temperature, many of the volatile substances are lost in an undistilled condition, with the tar in the hydraulic main and connecting pipes, in their liquid form, and combine with, or rather, take up, the naphthaline. Under an increased heat the greater part of these oils would form fixed gas, and consequently increase the volume of the gas manufactured. Though it is a great advantage to make use of as great a quantity of these lighter oils as possible in distilling the same to gas, we all know that all the lighter oils cannot be used up entirely in the distillation of coal, and thus it seems the duty of an enlightened gas engineer not to waste the same, but to make a judicious use of the same in keeping the gas as long as possible in contact with the gaseous vapors, and thus preventing the crystallization of the naphthaline which is contained in the gas. The lighter oils as long as they are united will, whenever they settle down in a condensed state, carry away a great deal of naphthaline in a liquid form, and the naphthaline will, in a pipe placed in proper decent, be carried on to the drips. The lighter oil vapors will separate from the gas at low temperature; in condensing, therefore, I fully agree with many, that the take-off pipes from the hydraulic main should be nearly on a level with the same, and should be of sufficient length. Clegg gives us as a rule, that for every inch of diameter, the working pressure being two inches; for instance, the take off pipe being ten inches in diameter, the proper length would be one hundred feet. By increased working pressure they will of course require increased length in ratio of their square roots; but even at this rate a great deal of the lighter oils will be lost in condensation.

I have found in my own experience that those oils, if collected in a little tank and re-vaporized, will greatly diminish the tendency of the naphthaline to crystallize, and at the same time improve the quality of the gas. The form of such an apparatus would be a small iron tank, closed at the top, and placed below the level of inlet pipe of the condenser, to which all drip water, and with it the lighter oils, must be conducted; the lighter oils will, from the nature of their specific gravity, float on the top of the tank. By passing a coil of steam pipes through the tank the lighter oils will be vaporized, and the naphthaline will settle at the bottom, and from there can, from time to time be let off. If from an insufficient amount of these lighter oils, some benzine, benzole, or naphtha can be added with advantage, particularly if coal be used containing only a small proportion of these lighter oils. Hydrocarbon vapors will surely liquify naphthaline in any pipe or vessel.

A further tendency of naphthaline to crystalize will be created if gas containing naphthaline is passed in from a hot to a cold place · say for instance, if the gas be stored in the holder and the same without a building is exposed to a heat of a high temperature; when let into pipes in the ground which are located in a lower temperature, naphthaline will surely crystalize, and in course of time will stop up the pipes more or less; or if the street mains are in certain locations laid too near the surface of the ground, and afterward the gas be passed into pipes located in lower ground, by which a variation of temperature is created, naphthaline will have a tendency to crystalize.

Mr. Hyde of Cleveland, also read a paper on the same subject.

NAPHTHALINE.

By G. A. Hyde, of Clevelaxd, Ohio.

In the manipulation of the gas, in the process of manufacture of illuminating gas, one of the annoyances to which the manager is subjected, is the deposit of crystallized naphthaline, and any experience had in regard to the course of its deposit, method of prevention or removal, is sought by most managers.

That the amount of this crystallization is variable is probably evident to most managers; but a diversity of opinion exists as to the real cause of its profuse development or else to the best method of preventing its crystallization and deposit.

Naphthaline is a white crystallizable substance evolved by the distillation of bituminous coal. When crystallized it is a very delicate film, yielding to the gentlest touch, yet, under favorable circumstanees, it compacts and is capable of considerable resistance. It has a peculiar faintly aromatic odor, not unlike narcissus; is heavier than water, and is readily dissolved by naphtha.

During the fifteen years of my experience as engineer of the Cleveland Gas-Light and Coke Company, in the manipulation of the gas varied results have been observed. In the process of condensing and washing the gas, our usual method has been to condense first and then to wash. At one time it was thought advisable to erect a spray washer between the hydraulic main and the condensers, as is the method in many gas works. Soon after there was observed a rapid accumulation of naphthaline in the drain leading to the tar-well, in the purifiers and pipes about the works, and also in the distributing mains in the streets. At a subsequent period these spray washers were removed and placed between the condensers and purifiers, used in connection with the purifiers, and very much less naphthaline was crystallized. During the periods mentioned the heats of the benches were what is termed "high."

During the past cold season, there was used with the common bituminous coal, from 4 to 8 per cent. of cannel coal; the heats were not high; the gas was kept hot while passing from the retort-house to the condensers—about 150 feet—by encasing the pipe; the condensation was very gradual, by the use of open air condenser, and but a small amount of water used in the scrubber and no spray washer. During this period we had no crystallized naphthaline.

It has always been observed that wherever high heats were carried, more naphthaline was crystallized than with medium heats, and that when a bench was lightly charged, after being cleaned of carbon and while hotter than usual, naphthaline appeared more abundantly than under ordinary circumstances.

My deductions from the experience at our works are as follows:

The crystallizing of naphthaline is caused first by "high heats," and the amount increased by rapid cooling of the gas by contact with cold water, cold pipes, and rapid cooling otherwise: and that naphthaline is more likely to be beveloped in gas made from slack coal than from lump coal. The remedy I would suggest for this annoyance is the use of a small percentage of cannel coal, in connection with the common bituminous coals, moderate heats, long exposure of the gas to hot pipes or other condensing operations, before reaching the cooling condenser; slow cooling of the gas and scrubbing with a small amount of fresh or ammoniacal water of moderate temperature; and, also, when found necessary, the introduction of a small continuous supply of naphtha into any horizontal pipes about the works, after condensation, or into the drips of the inlet and outlet pipes to the gas holders. The evaporation of the naphtha will dissolve the naphthaline crystals.

My deductions may not all be strictly correct, but my observations lead to these results.

Mr. Walker—I would like to ask Mr. Hyde as to the result.

Mr. Hyde—I can hardly answer that intelligibly. We have got big results this last winter, for the reason that we were running without seal.

Mr. Walker—What yield did you get?

Mr. Hyde—The yield has been very much greater since removing the half inch and heats just as high. I cannot give from memory the exact figures.

Mr. White—Upon the subject of naphthaline, if I may presume to again address the association, I had some troublesome experiences before learning its nature. High heats have been so constantly upbraided as the parent of this *enfant terrible*, and so thoughtlessly and unjustly, that I must try to rescue them from blame. I admit that high heats undoubtedly place us in position to be annoyed with this crystal, but so did the use of steam put us in jeopardy from railway accidents. Of late years we have been putting our brain work into our retort houses faster than in our other apparatus, and the result is the unfortunate under dissection. High heats, low seals, rapid evolution of the gases, their hasty removal from the retort, and their sudden plunging at a high temperature into the showers of spray washers, or through yards of chilling condensers, soon gave birth to the lusty and troublesome crystal nuisance that sheds its favors, like some divine blessing, upon the just and unjust, causing gas managers to drop into profanity.

The agency of heats in producing naphthaline lies simply in converting into a gas, at a high heat, olefiant qualities, that at low heats pass over as oils. In order to retain this (at that point) easily condensed, volatile oil in a gaseous form—three methods are open to us: We may mix free hydrogen with our coal gas at a high temperature; we may introduce into our coal gas, gas made from naphtha; or adopt the plan of having a long connecting main, protected from the atmospheric changes, between the hydraulic main and condensing apparatus, so retaining the crude gas as long as possible in contact with its own condensable vapors, and subjecting it to a gradual lowering of

temperature. I have made a practice of introducing the water into my condensers at the "outlet" end and taking the overflow from the "inlet" end, so causing the gas to come first in contact with pipes somewhat higher tempered than I could otherwise do, and so continuing my scheme of gradual cooling I use but little water in actual contact with the gas, believing more in the efficacy of the dry scrubbing it gets in passing the divisions of the washer, than in water as a cooling agent in that stage. (I may say, parenthetically, that since my visit to Cleveland I believe less than ever in the virtues of water.) Following these general views I have succeeded in escaping any further trouble from naphthaline, save an occasional warning presence in my purifiers, when I accept the hint and look for something wrong back of them.

When gentlemen come to understand the chemical laws governing the deposit of naphthaline, the great step to its prevention will have been taken, and it will pass out of the category of nuisances and be blessed for its useful qualities.

Mr. McIlhenny—I would like to add a word to what has been said. I must say that I endorse, to a great extent, what Mr. Hyde says as to naphthaline. Now, I find that the promotion of crystallization of naphthaline is always at a point where the temperature is very much colder than the point from which it leaves the holder. The gas does not change its condition after it goes into the holder, and I do not think the theory which Captain White advances, that coming in contact with its own constituents for any great length of time, will prevent its changing its condition by the condition of the atmosphere; for instance, you run a quantity of gas from a point—say at 80°—when the sun is hot, in the spring of the year, and into the ground; say that it is then 30° where the gas strikes the service pipe, close upon where it enters the building, the volume in the service pipe not being so great the moment crystallization takes place. I think the condition of the gas is not changed by its contact with other constituents of carbon. We ought to acknowledge that high heats convert these light carbons into gas, instead of leaving them in their original condition.

Now then, my theory is that when these light carbons are converted into gas, it is done by high heats; that if you can distribute it in an even temperature, you leave no naphthaline; but if you cannot, if the temperature of distribution varies, then I think you cannot prevent it.

[To be continued.]

"Collier's Candle."

An ingenious and useful contrivance thus designated, has been introduced in England. It is intended as a substitute for the ordinary tallow candles, or small open oil lamps at present used in collieries, against which there are great objections on account of the poor light they give, the great waste attendant on them, and the expense they involve. The new "candle," which is in fact a lamp burning "colzalene," resembles a metal bottle with a conical top, through an opening in which the wick passes. The wick is composed of cotton and steel wire. It certainly gives a very superior light, and we are told, at one-fourth the cost of tallow candles. With care it will last for years. The wick is permanent, but if it should require renewing, being only half-an-inch long, it can be easily replaced. A staple is supplied with each "candle," and this, passing through a suitable box attached to the candle, serves, when driven into a wall or prop, or into the ground, to support the candle in the place and in the position required. When trimmed, the patentees state the "candle" will burn steadily for ten hours or more, giving a brilliant flame, purer and whiter than ordinary gas, with a very high illuminating power, the cost of which does not exceed one half-penny for the ten hours, one gallon of "colzalene" being sufficient for fifty "candles." A small tin shield may be fitted upon the neck of the lamp, so as to prevent the draught blowing the flame about.—*Coal Trade Journal.*

Chemical Repertory.

No. 114.—June 16, 1874.

EDITOR—HENRY WURTZ.

CHEMICAL EXCERPTS.

1126. Water Power in Households.—This will doubtless soon be *un fait accompli*. A Jersey City paper says:

Engineers of sewing machines will be glad to learn that an apparatus has been patented whereby their machines can be run by water power. Parties in that city have one of the arrangements on exhibition. A stream a sixteenth of an inch in diameter, is the motive-power, and acts on a water-wheel attached to the machine The power is at the will of the engineer, and can be started or stopped instantly.

1137. The Revival of Cremation.—This modern movement, it is stated, originated with a distinguished member of the gas fraternity. Prof. J. Lawrence Smith, President of the Louisville Gas-Light Company, according to the public prints, claims precedence to Sir Henry Thompson in the advocacy of cremation, which he urged upon the people of New Orleans twenty years ago, describing a neat and appropriate furnace for the purpose.

1138. Tinctorial Products from Carbolic Acid.—According to Prudhomme, when phenol is heated 110°-120° with sublimed oxalic acid, there results a substance which is soluble in water, and which is deposited in the form of a red powder. The solution dyes wool and silk like rosolic acid. Alkalies give it a rose color. On heating to 180° rosolic acid is precipitated in the form of a green powder. The red powder and the rosolic acid give with hydrosulphite of sodium colorless combinations which are soluble in water and alcohol.—*Am. Chemist.*

1139. British Patent for Cements from Gas-Lime.—Reverend Granville Hamilton Forbes, Rector of Broughton, Northampton, June 4, 1872.—The inventor mixes refuse or foul lime from gas-works, for instance, with any marl or fine clay containing the necessary quantity of silica and alumina for the purposes of the said invention above referred to, in the proportion of about from 70 to 80 parts of the lime to about 30 to 20 parts of the clay in every hundred pounds by weight of the compound. I do not however limit myself (says the inventor) to the above proportions, as the quantity of sulphur in the foul lime leads to variations.

1140. Voltaic Gas Lighting.—Our readers have had accounts of the inventions of Klinkerfues. A reported improvement thereupon by Baron Oldershausen, of Vienna, consists in the employment of a sudden increase of pressure, a gradual increase having no effect, and in the attachment of a second burner, beneath the principal one, which is ignited by the heated platinum spiral, and is automatically extinguished, after it has ignited the principal burner. Mercury and floats are employed for extinguishing the accessory and principal flames.

1141. Naphtha Street Lamps.—These murky monstrosities infest large sections of the trans-Hudson settlements. The leading Jersey City paper thus compliments them:

"The gasoline, or vapor oil lamps, or whatever the flamers may be called that are erected to light many of the streets, especially on the heights, are about the worst specimen of an illuminating agency that could be made. They give out ten times more smoke than light, and the flame dances and flickers so that the streets and buildings on which the light is cast seem to be engaged in a game of leap frog. For street lamps the invention is a failure."

1142. Harlem Street-Gas. Is It So or Not?—The public press has this month told us the following tale. Until we know *who* the expert is, decision must be, in our case, reserved:

Commissioner Van Nort directed an expert to test the capacity of the burners on the public lamps, to see if they came up to the requirements of the contracts entered into with the several gas companies, requiring a capacity of three cubic feet per hour under a hydraulic pressure of one inch of water. It was found that all the burners were up to or above the standard, except those of the Harlem Gas-Light Company, which showed a capacity of only one and one-half cubic feet per hour. Commissioner Van Nort has therefore written a letter to the Harlem Gas-Light Company, calling its attention to the fact.

1143. Petroleum and Lightning Again.—The Markham Oil Well Derrick at Modoc City, Butler Co., Pa., was struck by lightning March 18, which passed harmlessly around the full tank, and followed the Union Pipe Line 80 rods to Phillips Brothers' well, which it fired, and Joseph Bushnell's 16,000 barrel tank, which it fired likewise, and forty rods further to Rynaman & Lecky's well. At 9 P. M. the great tank burst, and the run became a river of fire. Telegraphic communication was cut off from Pittsburgh, and the horrible paragraph in the *Pittsburgh Chronicle:* "A great many people are supposed to have been burned up; will give further particulars soon"—recalls the events of the late great eruption of Vesuvius. —*Prof. Lesley.*

1144. Importance of the Odor of Coal-Gas.—Alexander Miller, aged 45, was suffocated at No. 51 East Tenth street, May 12. Miller has had charge of the house since early in April, at which time it was vacated to permit of repairs. John Bell, a carpenter, went there to work as usual the next morning, but there was no reply to his ring at the door-bell, and after waiting a reasonable time, he forcibly effected an entrance. The lower rooms were all in order, the doors were securely locked, and the windows closed. The door of the front room on the top floor was closed but unlocked, and when Bell entered the sleeping-room of Miller he was driven back by the almost overpowering smell of gas. Returning he found Miller lying dead in bed with his arms extended, having evidently died without pain. The gas burner in the room was turned on full, though unlighted. The deceased did not possess the sense of smell, and therefore received no warning of the danger threatening him. Miller has a family in England.

1145. Gas in Trenton State-Prison.—The following Act of the New Jersey Legislature, was approved March 3, 1874:

1. Be it enacted by the Senate and General Assembly of the State of New Jersey, That the Board of Supervisors of the State Prison are hereby authorized to provide in such manner as to them may seem best, works for manufacturing gas, and to supply the said prison therewith; and to expend for the purposes aforesaid, a sum not exceeding twelve thousand dollars.

2. And be it enacted, That the comptroller shall from time to time draw his warrants upon the treasurer in favor of said Board of Supervisors for such sum or sums as shall be necessary for carrying into effect the first section of this act.

3. And be it enacted, That this act shall take effect immediately.

1146. Well Said.—What the London *Lancet* says about wells in Britain, we know, from our own experiments, to apply just as well with us:

The dangers of bad milk engrosses so much attention, that there is no reason to fear lest the far greater dangers of bad water should for the time be overlooked. We trust this serious error will not be committed. For one sample of dangerous milk a thousand of dangerous water could be obtained in almost any part of the country. Let it never be forgotten that very few rivers or wells are safe sources of water supply, and that as many are unsafe as loaded firearms.

The shallow wells of country towns are among the pests of the country, and it is high time that a zealous and well organized crusade should be brought to bear upon them. It is sickening in most country places to observe the uniformity with which the cesspool and well are made to stand side by side, as though each

was necessary for the other; and to think of the 20 feet or so of foul, sewage-reeking soil through which the water percolates to its fetid bed! The question should engage every health officer, and will, in too many cases, tax his energies severely, for it is one of the hardest sanitary problems. It is always possible to provide a city or town with good water, but, in a village, where houses are few, money scarce, and intelligence scarcer, it is a matter of exceeding difficulty.

1147. A Heroic Cure, by Stove-Gas.—A curious story is told by the Springfield (Mass.) *Republican* of the way B. A. Leonard, a dumb man, residing in Southbridge, that State, recently recovered his voice. He lost it about a year ago, while recovering from an attack of cerebro-spinal meningitis; but a few mornings ago he was awakened about 4 o'clock by a sense of oppression and faintness. He became conscious enough to understand that gas was escaping from a coal stove, and that he would soon die unless he could get to fresh air; so, after many falls and tumbles, he gained the outside door, when he fainted, but was soon aroused by the lapping and tugging of a faithful Newfoundland dog. Then the thought came to him that his wife and child were in the house, and though he had not spoken for months, he called loudly for help. His cries, united with the howls the dog set up, soon roused a neighbor, to whom he told his troubles, and again fainted, and was insensible for two hours. On recovering he was unable to talk, but the doctor on hearing the case, caught an idea and ordered him to visit the gas house and breathe air in the purifying-room. After spending an hour and a half there he could talk in a whisper, and has since steadily regained the perfect use of his voice.

1148. Heating Cars in Germany.—Bayard Taylor, in one of his interesting letters, thus describes a method of heating cars in Germany:

"When I left Gotha the first cold weather had just arrived; the thermometer stood about zero, there were six inches of snow on the fields, and every traveler was bundled in furs from head to foot like a Russian. The cars were heated by tin boxes under the seats filled with steam from the engine—surpassing in discomfort any method that could be devised. Imagine a cold floor and a hot seat! Like the process adopted for enlarging the livers of the Strasburg geese, it created a fever instead of a healthy warmth, and we reached Frankfort, after a trip of five hours, in a state of complete exhaustion. I was amazed at the endurance of a German, our only fellow-traveler in the compartment. He wore an overcoat an inch thick, sat with his feet in a deep fur bag which was drawn up to his knees, covered his lap with a heavy plaid, and then buried himself in a fur robe, while the seat under him was hot enough to char the end of the *os sacrum*. From time to time he cast a melancholy, reproachful glance upon us, who, gasping for breath, persisted in having our window open, with the right and the power which three against one usually gives."

On Dits.

In 1873, a Dublin chemist, Dr. Cameron, found that out of twenty-three public wells in that city, sixteen, or 70 per cent., were so "loaded with dangerous organic impurities as to be utterly unfit for use."

The Clarendon Hotel, at Saratoga, is to be lighted by private gas works.

Ninety-eight thousand two hundred and fifty dollars is estimated to be the amount needed to repair the patent pavements put down in New York, at such great expense, not many years ago.

The London *Standard* says the prospect of a water famine in certain parts of England, during the summer and autumn, is not altogether imaginary.

In Berlin, Prussia, the city has been authorized to borrow ten millions of thalers, to purchase and enlarge the water works of the city, which at present belong to an English company. The loan is to bear interest at 4½ per cent., and to be repaid in 37 years.

Slandering the Innocent.—In Reading, Penn., when a fellow departs from the strict line of the "naked truth," they say he lies like a gas meter.

The Lamp.

FIRST ANNIVERSARY CELEBRATION OF THE LACLEDE GAS LIGHT COMPANY.

Just a year ago yesterday the Laclede Gas-Light company lighted their first lamp on the streets of St. Louis. Prior to that time the lighting of the city had been wholly in the hands of the St. Louis Gas Light company, but a party of eastern capitalists became possessed of an old charter, and under the name of the Laclede Gas Light company, acquired, by agreement, the right to light that portion of the city north of Washington avenue. They built splendid works, investing over a million dollars in the purchase of the land and the construction of the buildings, and to that fact is due the reduction of the price of gas in St. Louis.

Yesterday the president and directors of the company, with a few invited guests, assembled at the works, corner of Main and Mullanphy streets, and were conducted over the premises. About 350,000 bushels of Pittsburg coal was found in the yard, ready to be transformed into illuminating gas, and the machinery was there to hasten the transformation.

After thoroughly inspecting the works, the party adjourned to the private office where a general good time was had in congratulating the company on its progress. There were present S. L. Husted, president of the company; F. Cromwell, vice president; Jacob C. Zabriskie, superintendent; H. Attrill, the contractor who built the works; Charles Gibson, attorney of the company; Oliver Hart, President St. Louis Gas Light company; Charles H. Peck, vice-president St. Louis Gas Light company; Thomas Pratt, chief engineer; William D. Marshall, A. V. Barringer, Jos. Kilpatrick, and many others.

The party were cordially entertained by the officers of the company; speeches were made and toasts were drunk, all tending to show the estimation in which the Laclede company and its officers has acquired in the minds of St. Louisans generally.—*St. Louis Times*, May 26, 1874.

Society of Engineers of California.

The Society of California Engineers held its first ordinary meeting on Tuesday evening, May 5, at the Third District Court Room, Mechanics' Institute. Cards of invitation having been issued by the members, the attendance was composed principally of the proprietors and superintendents of the various foundries and machine shops in the city. The President, Mr. G. F. Allardt, addressed the society briefly in relation to the field for research open to it, and its prospects for the future. He enumerated the different subjects of local interest which it would be well for the members to touch upon in their investigations, and took occasion to suggest that the society should be careful in selecting new members, choosing only those who were worthy of being admitted, as experts in some special branch.

Mr. J. E. Spiers, M. E., of McAffee & Spier's Boiler Works, read a highly interesting paper on the subject of "Boiler Pressure." Mr. Spiers is a practical boiler maker, and his views were listened to attentively by those present. His paper was quite exhaustive, and was filed for future publication. There was some little discussion on the conclusion of the reading of the paper, which was engaged in by Messrs. Dickie, Hanscom and Spiers.

Col. W. J. Lewis, C. E., then read a paper "On the Calculation of Earthwork," illustrating his remarks with wooden models of the various forms of which he epoke. His paper was rather abstruse; and as frequent reference was made to letters and figures on the models, which could not be seen by the audience, it was difficult to follow him in his line of argument. A blackboard will, however, be furnished by the next meeting, when such subjects can be better explained by means of figures.

The following papers are announced as being in preparation for the society: "On Compound Engines," by Mr. G. W. Dickie, mechanical engineer, of the Risdon Iron Works. "On Quartz Mining Machinery," by Irving M. Scott, of the Union Iron Works, mechanical engineer. "On the Mechanical Condensation of Vapors," by James R. Smedberg, consulting engineer of the San Francisco Gas-Light Company. "On Sea Diving," by Mr. C. H. Lougee, submarine explorer.

The society has made a good start, and is composed of the right sort of men to undertake and carry on such an organization. The present members are: G. F. Allardt, civil engineer; G. W. Dickie, Risdon Iron Works, naval engineer; Melville Atwood, mining engineer; C. H. Lougee, submarine explorer; A. V. Ojeda, engineer of steam marine; Samuel H. Wheeler, mechanical engineer; James R. Smedberg, gas engineer; Irving M. Scott, Union Iron Works; W. A. Goodyear, mining engineer, late of the geological survey: Joseph Moore, Risdon Iron Works, mechanical engineer; William J. Lewis, civil engineer; A. C. Dithmar, mechanical engineer; W. A. Phillips, engineer of steam marine; W. W. Hanscom, Ætna Iron Works; James Spiers, mechanical engineer; J. Bermingham, mechanical engineer; A. S. Hallidie, President Mechanics' Institute; William R. Eckart, Marysville Foundry; David Stoddard, mechanical engineer.

The officers are as follows, President, George F. Allardt, C. E., Engineer Tide Land Commission; Vice-President, W. W. Hanscom, proprietor Ætna Iron Works; Treasurer, George W. Dickie, Risdon Iron Works, Mechanical Engineer; Secretary, James R. Smedberg, Consulting Engineer San Francisco Gas-Light Company.

Applications for membership should be addressed to James R. Smedberg, Secretary Society of Engineers of California, Gas Office, San Francisco.

Verdict Against the Metropolitan Gas Co.

From the newspapers we learn that on June 2nd, Elizabeth Morey sued the Metropolitan Gas-Light Company for $2,000 damages, and the trial of her case came on before Judge Freedman in the Trial Term of the Superior Court. It appeared from the evidence that the gas company had for nearly two years forgotten to send bills to No. 343 West Fiftieth street, and had no record of what bills it ought to send. Finding out its omission, it sent a bill merely estimated for the whole time to the house. Afterwards, being informed that Mr. and Mrs. Morey had only occupied the house for a brief period, it divided up the bill—still by guess—between Mr. Morey and the former tenant. Mr. Morey was then absent; but a little while after Mrs. Morey, the present plaintiff, deposited with the company $50 as security for a meter and for a future supply in her own name; and thenceforward, so long as gas was supplied, paid her bills.

There was some testimony to show that the husband endeavored to get some reliable statement of how much he owed and offered to pay it, but both Mr. and Mrs. Morey testified that immediately before the 28th of August it was arranged between them that the wife should thenceforward assume all the responsibilities of the house. About two months later the gas was cut off, and the business of keeping a boarding-house carried on by Mrs. Morey was broken up.

The defence was that she was substantially the keeper of the boarding-house before as well as after the giving of the new meter to her in her own name, and that question was submitted to the jury. The jury, after a brief absence, gave her a verdict for her whole claim—$2,000 damages and $50 deposit.

Johnson & Ward and George A. Martins for plaintiff; Bardslee & Cole for defendant.

Composition Gas and Water Piping.

Mr. J. Fottrell, of Dame street, Dublin, manager of a public company, has patented an improved composition for the manufacture of pipes and tubes, suitable for water at high pressure, and as conduits for sewage purposes, gas, brine, and other saline liquors. The

invention consists in the manufacture (by fusion of the ingredients) of a homogeneous composition, forming a concretion or artificial stone, possessing all the qualities of hardness and durability of the natural substance, such composition to be employed in the construction of tubes for the conduit of water at high pressure, gas, sewage, brine, and other saline liquors, or in the manufacture of useful or ornamental forms by moulding or casting the same. When greater density or special sharpness in the castings is desired, pressure is applied to the moulds. Mr. Fottrell says:

"The ingredients herein mentioned, and the proportions they bear to one another being an essential feature of the composition, I shall here state, as example, the proportionate quantities requisite for making a certain quantity of pipes: 13 cwts. of finely powdered stone; 4 gallons of shale oil, or an equivalent having the same boiling point, or from which the more volatile oils have been distilled off; 2 cwt. of Trinidad bitumen; 2 cwts. of bituminous rock. The object of the shale oil is to enable the bitumen to perctrate the stone and unite the natural bituminous rock with the bituminous stone. The whole is intimately mixed and kept well stirred whilst boiling, till it comes to a certain consistency dependent on the purposes to which the substance is to be employed; it is then run into moulds previously prepared to give color to the material."

Correspondence.

[Correspondents, in all cases, should sign their communications with their names and address in full—not necessarily for publication, but as a guarantee of good faith.—ED.

Gas and Guano.

KNOXVILLE, TENN., June 9, 1874.

Mr. Editor: I was much interested with your editorial, in the last issue of the Journal, headed "Gas and Guano." I believe with you, that we run to waste out of our gas works, enough of ammonia that would take the place of, and make a fertilizer equal in value to guano.

I presume most gas managers are acquainted with the mode of obtaining the sulphate of ammonia from their ammoniacal liquor. The process is simple and not very expensive; but it seems to me the all-important question is—will it pay?—and on this point I am quite in the dark, and would be greatly pleased to be enlightened by you, or some of your readers.

I do not even know if there is a market for sulphate of ammonia. I thought once of manufacturing it here, but from enquiries I made I found the farmers did not use fertilizers. We prefer to work and exhaust our land until it will produce nothing but weeds, then we sit down and bemoan our bad luck, and sigh for the good old times. Perhaps this is partly the reason so much of our ammonia and other products run to waste—the want of a market for them. I am glad you finished your editorial with, "More anon on this momentous topic. Respectfully,

JAMES SOMERVILLE.

Purifying Gas by Atomized Liquids.

The question of purification of illuminating gas is one of general interest to the gas maker, in securing the most economical and satisfactory contrivance for removing poisonous impurities, and to the consumer in having that very essential work most thoroughly accomplished. Coal gas leaves the retort heavily charged with aqueous vapor, so heavily indeed that the slight reduction of temperature which is effected in the hydraulic main, causes the greater part of it to be deposited in the form of water, holding in solution a considerable quantity of sulphur and ammonia compounds. The minute state of subdivision in which the water exists while in the vaporous state, is exceedingly favorable for the removal of the soluble impurities; but, unfortunately for this natural process, gases and vapors are much less soluble in warm than in cold water, and the consequence is that, by the time the gas has been reduced to a temperature favorable to a rapid solution of the impurities, the watery vapors have been almost entirely precipitated by condensation, without removing the impurities from the gas.

As a remedy for this difficulty, and in order successfully to carry out the beautiful process provided by nature, Mr. B. E. Chollar, a young St. Louis engineer, has suggested a very valuable improvement. His method is a close imitation of the natural process of condensation, but with the very important difference that the water is injected by means of a small jet of the gas itself, compressed by a small pump for that purpose. By this means the water is so completely comminuted and dispersed as practically to be reduced to a vapor, while at the same time the temperature is so low as to effect a rapid and complete removal of the soluble impurities, with the expenditure the minimum quantity of water, and without causing the slightest extra pressure. The process is so simple and economical, and possesses so many points of advantage, that in all probability it will gradually displace the old-fashioned coke scrubbers throughout the country. —*St. Louis Journal of Commerce.*

Preserving Brickwork.—The exclusion of damp from brickwork has long been an important problem with builders. It is stated that one of the most effective methods of accomplishing this object is the following:

Three quarters of a pound of mottled soap are dissolved in one gallon of boiling water, and the hot solution spread steadily with a flat brush over the outer surface of the brickwork, care being taken that it does not lather; this is allowed to dry for twenty-four hours, when a solution, formed of a quarter of a pound of alum dissolved in two gallons of water, is applied in a similar manner over the coating of soap. The soap and alum form an insoluble varnish, which the rain is unable to penetrate, and this cause of dampness is thus said to be effectually removed. The operation should be performed in dry settled weather.

Another method is to use eight parts of linseed oil and one part of sulphur, heated together to 278° in an iron vessel.—*Sci. Am.*

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Trinidad Bitumen	— —	@	14 05

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TUESDAY, JUNE 16, 1874.

WISHING TO MAKE THIS JOURNAL an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of these subjects a pleasure, or a profession.

Subscribers would confer a favor upon us by remitting *CHECKS*, or *POST OFFICE MONEY ORDERS*, as we are frequent losers where money is enclosed in letters.

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GAS-LIGHT ASSOCIATION OF THE UNITED STATES.

As the proceedings of the Association will run through at least two more numbers of the Journal, it will probably be best to eefer any general review until another day. The discussion on the Insurance question, which takes up so much space in the present issue, might receive a few words now, however, once for all. Though we appreciate the zeal with which Mr. Williams has thrown himself into this subject, and sympathize with him in his failure to enlist the association, as such, in his plans, yet we cannot but agree with those gentlemen who regarded the matter as outside the scope of the organization. Under the original ideas which ruled many of the first promoters of the movement, this scheme might, in some form, have been appropriate; but it seems clear now that other ideas rule, and that financial schemes should be ruled out. It is merely one of the straws that show the way the wind blows, and confirms us in our conclusion that the Association will soon be fully merged into a league for mutual improvement in knowledge, and for the encouragement of a fraternal feeling and the establishment of that kind of unity of spirit and purpose which should reign, throughout a profession that has so much to do with the promotion of human civilization and comfort.

GAS-WELLS AGAIN.

In recent issues we have given prominence to the new idea of Mr. Charles Plagge, a German gentleman of scientific attainments, who has proposed to make practical application of gas wells, which are such abundant possibilities, in our own belief, over so much of our territory—for keeping navigation open in winter. May 16 we showed that it is not altogether beyond the range of probability that Mr. Plagge's idea may apply even to the channel of the great Hudson itself, as one of the formations known to be saturated with gas further west, underlies, as we pointed out, the Catskill mountains, and cropping out within a few miles of the banks of the upper Hudson estuary. One of Mr. Plagge's suggestions to us, in conversation, was that the development, by the explorations he desires to institute, of outflows of gas throughout New York, if even the canal scheme should not be justified, would surely be of immense value in the reduction of iron ores, and the manufacture and working of iron and steel.

Think what a noble thing may be before us:—should we find ourselves able to tap and draw from stores of gas pent up under the Catskill range, conduct this gas to the brink of tide-water along the Hudson, and operate therewith upon the pure limonites of Putnam, Dutchess and Columbia, and the magnetites of Orange and Rockland, Champlain and the Adirondacks. "Making two blades of grass grow where one grew before" would be a feeble figure of speech to apply!

We now have this at least to say, regarding the application of wells to iron-working—that *this* is now no myth, and no matter of speculation whatever.

From Pittsburgh we learn that this application has actually been made successful on a manufacturing scale, in that section. Leechburg, the locality of the operation, is some 25 or 30 miles northeast from Pittsburgh; and here a Mr. Rogers has carried the gas from a well sunk for oil, for some distance to his rolling mill, where it makes the steam, puddles and anneals the iron and lights up the works. The yield and quality are "incomparably superior," and the time less, the profit in money being $100 per day! An eye-witness, evidently well-informed in such matters, states (Pittsburgh *Commercial*) that the manufacture of iron throughout those parts will be at once and completely revolutionized. Other wells are being sunk and projected, and new works erected. The iron so made is stated to be worth from $10 to $20 more per ton than that made with coal, and the quantity is one-third greater! The statement reads almost like a hoax, but it is undeniable matter of fact.

So much for what Mother Nature's gas works are doing for Pennsylvanians. Will not New Yorkers move in this direction, who can no doubt do even better in the way of gas wells?

COAL-TAR PRODUCTS.

We often have inquiries as to where collected and systematized information on these products may be found. It will be useful therefore at least to some of our readers to state that there are now, in the French language, two compendious works; one by Girard and De Laire, called "Traite des Derives de la Houille," and a French translation of the fine German treatise of Bolley and Kopp, which latter work is thus made accessible to a much larger circle of American readers. The two works differ somewhat in their scope, and those who wish to be completely posted up, including, we think, all gas-men who desire to be well-read, should have both books. The one last named commences with an account of coal-tar and its rectification, and considers in successive chapters, phenol, its homologues and and derivatives; benzole, its homologues and derivatives, including aniline, toluidine, xylidine, cumidine, and the manufacture of their red, blue, violet, green, yellow, black and grey compounds; naphthaline and its derivatives; and, finally, the coloring matters obtained from phenol. An Appendix describes artificial coloring of different origins, such as cyanine, the aloes colors, rufigallic acid, and murexide. There is an elaborate bibliography and a good index, in which the work of Girard and De Laire (like most all French books) is wanting. The student will find here many valuable indications concerning fields for future research, and the practical man will meet with not a few hints of unquestionable importance.

The London *Chemical News* says, in relation to this new French edition:

"The appearance of such a work so soon after that of Girard and De Laire is a new proof, if proof were still needed, of the lively interest in the progress of applied chemistry felt on the Continent. Meantime, what are we doing? Instead of developing native talent, we are more and more placing the management of our chemical manufactures in the hands of foreigners, just as the Romans, in their decline, filled up the ranks of their legions with stranger mercenaries. *Absit omen!*"

American readers would not do ill to note well the last sentence, in which a deep lesson of history is contained.

The saving and utilizing of products otherwise waste, is a branch of applied chemistry which is to play a great part in the future history of gas works. The subject of ammonia-saving we have already referred to before, and shall pursue hereafter in special articles.

Here we wish to refer only to one or two important points, of recent development. It would seem that at least one reason why effete gas-lime and other products of gas purification are inap-

plicable for fertilizing purposes, is the presence of *sulphocyanogen*, or rather of sulphocyanide of ammonium. One part of this salt in 40,000 of soil is fatal to all vegetation and germination. On the other hand, the English chemist Dr. Phipson makes a curious suggestion about sulphocyanide of ammonium. When its solution is heated with iodine, a brilliant yellow substance, which has been considered as sulphocyanogen itself, separates.

Phipson recommends this as a new pigment, of extraordinary brilliancy! This singular substance may be ground up with 90 parts of white lead, and even then, when mixed with oil, it requires more white to bring it to the color of chrome-yellow. Sulpho-cyanogen, which, when dried at 108°, has the composition C_2NS, is soluble in sulphuric acid, and is re-precipitated by water. It is decomposed, with effervescence, by nitric acid. Sodium also acts on it with violence, producing sodium sulphocyanide, and sulphide.

NAPHTHALINE.

It is quite remarkable to see how much attention the subjects of naphthaline in gas, its deposition in gas-pipes and its removal therefrom, are attracting at present throughout the whole world of gas. Two papers, for example, as will be seen by our report today, were read to the American Gas-Light Association at Cleveland, and we find also in the list of papers which were to have been read to the British Association of Gas Managers, on the 9th 10th and 11th of this month, one by Mr. James Watson on "Condensation and its Effects in the Retention of Naphthaline," and another by Mr. G. D. Malam, on the "Retention of Naphthaline."

When we receive the reports of these papers, and the discussions which may be hoped to have arisen therefrom in the British Association, we shall have before us a considerable mass of information and experience, from men who have had to fight this somewhat mysterious adversary, and who have had to realize the maxim—"*Fas est ab hoste doceri.*" It will then be time to attempt to draw together and generalize the mass of facts, and see whether some working theory can be constructed, which will help us in coping with the foe. So far it would seem that American engineers fail to agree, altogether, even upon fundamental points—even as to whether high or low heats most favor the formation of naphthaline. Our own belief is that the solution of all these mysteries will ultimately be found very simple, when proper chemical experiment is applied, to elucidate certain chemical and physical qualities possessed by this special material, though not peculiar to it alone; but which separate it rather widely from the other products of destructive distillation, so far as known.

THE CHEMICAL CENTENNIAL.

The remarkable movement thus designated, the idea of which was originated but a few weeks since, by Dr. Bolton, of New York, makes the most gratifying progress; and a great success is already assured. Our own view, announced a month ago, that the Grave of the illustrious Priestley, at Northumberland, Pa., should be the place, has obtained such rapid and almost universal acceptation, that the Committee has now definitely decided upon this locality; and upon the first of August—the actual *Centenniversary* of the first discovery of oxygen—as the time, for a meeting of American chemists around the tomb of its discoverer, to initiate a new century of progress of chemistry in America. [The first of August occurring, however, on Saturday, the meeting will be called for the previous day.]

The presence of a large number of the most distinguished chemists of America, is promised; the townspeople of Northumberland unite cordially in offering their aid, and even their hospitalities; an Oration is expected to be pronounced by an eminent gentleman; and other imposing ceremonies are being arranged. Prof. Henry, of the Smithsonian Institution (which was established by a chemist), will come, and will bring some of the original apparatus of Priestley, relics from the stores of that Institution.

It may with reason be expected that this will be the most important and significant scientific gathering ever held on this Continent; a solemn historical occasion, which may develop germs whose fruition in the future is destined to exalt, in an important measure, the status of true science among the people of the New World.

THE GEOLOGICAL SURVEY OF PENNSYLVANIA.

As we hoped and anticipated, in our former reference to this subject, this great work, now to be newly resumed under a late legislative act, has been committed to the hands of Prof. J. P. Lesley, as State Geologist of Pennsylvania. As yet we have no details of the further organization, but accept the prompt appointment of the right man for Director, as an assurance that equal judgment will be exercised in what remains to be done.

This is a subject in which our readers should take no slight interest. So long as Pennsylvania remains the great coal-cellar of the nation, whence so overweening a proportion of our gas-coals, for example, must be extracted; this is so obvious that we need make no apology or excuse for volunteering, even for demanding, some little voice in this great matter. Prof. Lesley's appointment puts beyond peradventure the faithful, thorough, and truly scientific performance of the field-work of the new survey, and the geological (we might add, the literary) work generally; but our readers are, with others, no less interested in the performance as well of the *laboratory* part of the work. The gas, fuel, and iron interests will equally look to this, with expectation; and, we should think, would be far from satisfied, in this case, with the stereotyped style in which the chemical and analytical work of our State Surveys is generally *executed* (the quip is by no means inapplicable here, though there are, of course, a few meritorious exceptions).

We would now but throw out the suggestion that it will be expected of Pennsylvania that she should take the opportunity to procure and promulgate—both to her own people, and throughout her wide outside range of customers—facts and figures, obtained by the application of the most advanced theories, methods and instruments of precision, regarding the composition, gas, coke, and heat producing powers and capacities, both qualitative and quantitative, of her numerous varieties of coals; far in advance of any similar work heretofore undertaken on this continent.

☞ THE CHAPMAN VALVE.—We call the attention of Gas Engineers to the advertisement of the Chapman Valve Company, which will be found in our advertising columns. This company claims that the Chapman Valve is peculiarly adapted for gas works and gas mains. The seat is formed of an alloy which resists the action of illuminating gas, and the compounds usually associated with it. It is cast in a dove-tailed groove, in the body of the valve, and no grinding is required to render the valve tight. Owing to the dissimilarity of the metals, there is no danger of cohesion taking place between the gate and seat, and it can be depended upon to open easily, however long it may have remained closed. All the working parts are contained within the body of the valve and not exposed to rust. The gate is hollow and slightly conical, and the metal of the seat being slightly compressible, when the gate is brought to its bearing, it is sure to be tight.

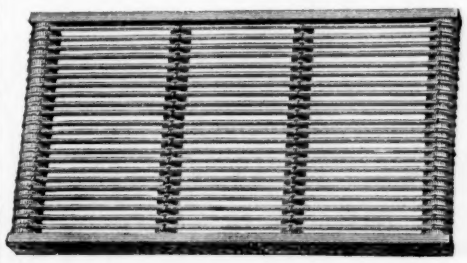
Errata.

In the issue of May 2nd, page 148, in Dr. Hayes's article, middle column, an error occus twice, which is scarcely excusable, and should not have been overlooked in reading the proof. The distinguished author has himself directed our attention to it.

In line 7 from top, "at 480° Fah." should be expunged, also in line 38 from top "480° to 650°" should be erased.

THE MANHATTAN

LIME HURDLES.



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1½ to 48 inches diameter.
Cast Iron Flange Heating and Steam Pipe.
STOP VALVES FOR WATER OR GAS, ALL SIZES.
Fire Hydrants,
GAS HOLDERS,
TELESCOPIC OR SINGLE.
☞ Castings and Wrought Iron Work of all kinds for Gas Works 253-6m

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Franklin Foundry and Pipe Works,
MANUFACTURERS OF
GAS, WATER, AND OIL PIPES,

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N. B.—Pipe from 3-inch and upwards cast in 12 ft. lengths.
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Prof. Henry Wurtz.
Scientific and Practical Chemist and Geologist.
Editor of "The Am. Gas-Light Journal."
PRIVATE OFFICE AND LABORATORY, 12 HUDSON TERRACE, HOBOKEN, N. J.
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Consultations in the city may be arranged by appointment, at the GAS-LIGHT JOURNAL Office, 42 Pine street Room 18, or elsewhere. Address to private office.
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Prof. W. makes a specialty of GAS CHEMISTRY, and the Analysis of Gas, Gas and other Coals, and Potable Waters. Has special laboratories and unequalled facilities for these purposes. Formerly Chemical Examiner in the U. S. Patent Office, and peculiarly competent as an
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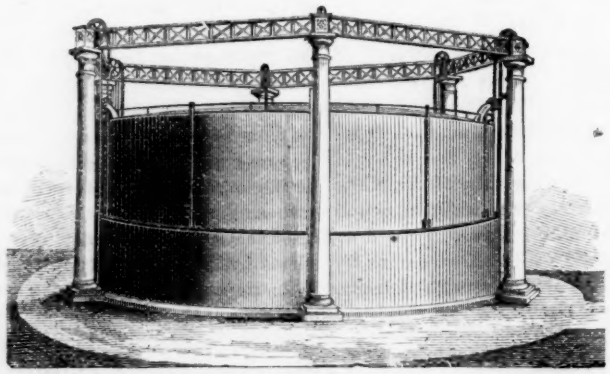
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Professor WURTZ desires to call the special attention of all engaged, and interested, in the MANUFACTURE OF GAS, or the PURCHASE OR SALE OF GAS-COALS, to his
GAS LABORATORY,
now the most complete one in the country, for the Testing and Complete Analysis of GAS-COALS and of GASES.
His Apparatus being all arranged at his own residence in Hoboken, and involving many improvements in construction and methods, he is enabled to make such Analyses at greatly reduced cost, and with the utmost promptness as to time, and reliability as to results.
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will be executed, or supervised—when desired—by Prof. WURTZ himself, at the Yard, on the Vessel, at the Mine, or elsewhere. INSTRUCTIONS FOR SAMPLING will be sent, when requested. Charges necessarily vary according to the amount of work done.
QUANTITY and CANDLE POWER of Gas only may be determined, or, in addition, determinations may be furnished of VOLATILE MATTER, COKE, and ASH, of SULPHUR in the COAL, COKE and GAS. Analyses made of the Gas also, and determinations of the DENSITY of the same and of its PERMANENCY under cold, time, and pressure. Elementary Analyses of Coals and experimental determinations of relative HEATING POWER.
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(Late of the CRYSTAL PALACE DISTRICT GAS WORKS, London, England, and the NEW CITY GAS WORKS, Montreal, Canada.)
CONTRACTORS FOR
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☞ Retorts set on what is known as CATHELS'S PLAN FOR SETTING RETORTS.
Retort Setters sent to all parts of Europe and America.
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FOR SALE.—GASOMETER, 7000 CUBIC FEET CAPACITY, in good order, ready for shipment.
DRY CENTER SEAL, six inch connections.
Four Round PURIFYING BOXES, four feet diameter, six inch connections, no covers or trays.
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Builders of Gas Works.
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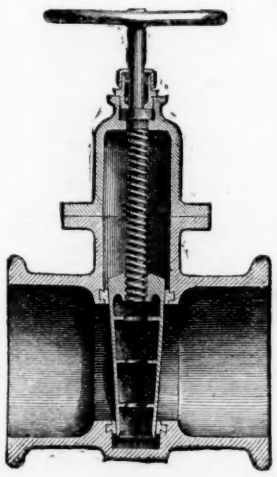
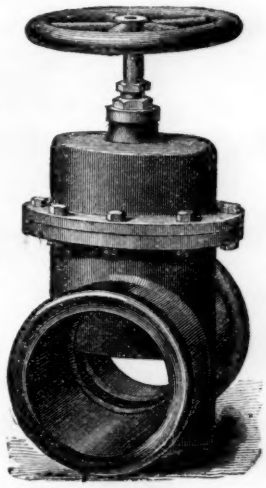


These Valves have been in use for several years, and are pronounced by all who have used them to be

The Best Gas Valves Ever Made.

They afford a direct passage the full size of the pipe. The seats are made of an alloy similar to BABBITT metal, specially prepared for the purpose, and superior to all other metals used for the seats of Gas Valves. It does not corrode under any circumstances to which it is exposed.

There is NO LIABILITY OF COHESION between the Gate and Seat, and the Valves can be relied upon to SHUT TIGHE and OPEN EASILY at all times—an important desideratum when used for street mains, in cases of fire.



We refer to the following named Gas-Light Companies among the many that have used these Valves:

BOSTON GAS-LIGHT COMPANY, BOSTON, MASS.
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PEOPLES GAS-LIGHT COMPANY, BROOKLYN, N. Y.
CITIZENS GAS-LIGHT COMPANY, BROOKLYN, N. Y.
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GAS AND WATER VALVES ½ INCH TO 36 INCHES DIAMETER.
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Of West Virginia,

Offer to Manufacturers of Gas the pure Cannel Coal from their Colliery at Cannelton, West Virginia. This coal after having been thoroughly tried by the most expert and reliable Engineers, has shown itself to be the most valuable **Enriching agent** produced in this country—a gross ton yielding **10,000** cubic feet of gas, of **64.54** candle power, to purify which, required only two bushels of lime. The yield of coke is **32 bushels** of good quality, quite light, burns freely, making a very hot fire. For further information address

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PEYTONA CANNEL COAL

From West Virginia.

Yields over **13,000** feet of Gas per ton. At ten thousand feet (standard yield) the illuminating power is over **43** candles. Purifies **4,510** feet to the bushel of lime.

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PROVIDENCE, R. I.,

BUILDERS OF

Coal and Rosin Gas Works,

FOR TOWNS AND MANUFACTORIES.

Estimates furnished of the cost of Works, and cost to Manufacture Gas in any Locality.

Gasholders,
Iron Truss Retort House Roofs,
Water Tanks,
Purifier Covers,
Coke Barrows,
Cast Iron Socket Pipe.

Particular attention given to Enlarging and Re-building Gas Works.

For Lighting Manufactories, our Rosin Gas Works have been successfully used for *many years* past. They require but a small outlay, and afford a *safe* and *economical* light.

FOR SALE AT MANUFACTURERS PRICES:

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REFER TO

Manufacturers' Gas Co., Fall River, Mass.; Youngstown Ohio, Gas Co.; New Rochelle, N. Y., Gas Co.; Homer and Cortland, N. Y. Gas Co.; Danbury, Conn., Gas Co.; North Bridgewater, Mass., Gas Co.; Cold Spring, N. Y., Gas Co., Rockville, Conn., Gas Co. Taunton, Mass., Gas Co.; Pawtucket, R. I., Gas Co.

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GAS WORKS CONSTRUCTION AND *Supply Company.*

President—JAMES A. TAYLOR, Columbian Iron Works.

Engineer—A. F. HAVENS, late of Brooklyn Ca Light Co, Patentee of the following inventions:

HOISTING ENGINES,
COAL ELEVATORS,
WIRE-ROPE RAILROAD,
TRAYS FOR LIME OR IRON
RETORT CHARGING AND RAKING MACHINE,
RETORT SETTINGS,
SELF-SEALING LIDS,
AUTOMATIC DIP-PIPE SEAL
SECTIONAL PURIFIERS.

The above Patents are the result of many years experience, and are of great value, enabling any Company to increase the capacity of its Retort and Purifying Apparatus 15 to per cent without change, and at slight cost.

Plans, Specifications, and Details furnished of all Apparatus, and Companies supplied with every thing required in Gas Manufacture, from the greatest to the least, at the lowest market rates.

American Gas Works Construction and Supply Company,
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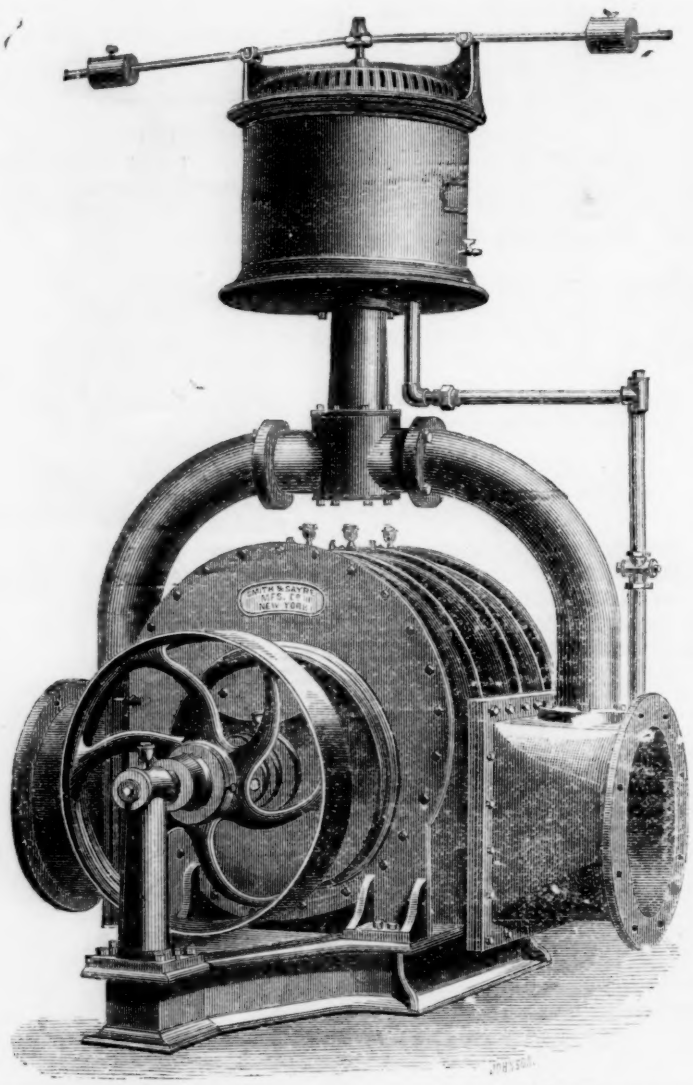
☞ Mr. HAVENS can be consulted on all matters appertaining to Gas and its manufacture, gratis.

SMITH & SAYRE MANUFACTURING COMPANY.

The Mackenzie Patent Gas Exhauster

And Patent Compensator.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan.

The Cupolas are manufactured in sizes to melt from 1 to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent fuel. Address

G. G. PORTER, President.

JAMES M. SAYRE, Treasurer.

OFFICE, 96 LIBERTY STREET, New York.

CHARLES W. ISBELL, Secretary.

AMERICAN

GAS SCREEN MAN'F'G COMPANY.

TO GAS-LIGHT COMPANIES.

Your attention is respectfully called to the GAS SCREEN now being manufactured by the American Gas Screen Manufacturing Company, under the patents granted to E. DUFFEE, and are pleased to submit the following points of their excellence and superiority over all other screens now in use.

The Screen is made with an oak frame, interlaced with split rattan, drawn through holes at regular intervals in the Frame and cross-pieces, the edges of the frame being grooved to prevent abrasion.

The advantages of the screen are:

1st. The large purifying surface, the construction of the Screen giving over three-fourths of the surface for the gas to penetrate the lime.

2d. On account of the free passage of the gas through the screen the pressure is reduced, thereby preventing the accumulating of carbon on the retorts.

3d. The saving of lime and labor, as the Screens are not liable to clog, and are easily cleaned.

4th. Their cheapness and simplicity of construction.

5th. Their DURABILITY—they can be used longer than any other now used.

Testimonials.

PROVIDENCE, RHODE ISLAND, March 21st, 1872

E. DUFFEE, Esq., Agent, etc.

Dear Sir: The Trays manufactured by you for our West Station were put in use in September last, and have *given perfect satisfaction.*

The frames are well put together, and I see no reason why they will not last for a long time. The *very large amount of* open space in these Trays gives the gas an easy passage, and brings it into contact with the lime much better than when the space is so contracted, as is the case in most of the other Trays in use.

The pressure thrown upon the retorts by contracted passages is very great, and were gauges used more frequently than they now are in many gas-works, this facat of having *open Trays* would become more apparent to mangers of gas works. The digerence in pressure at this station in passing the gas through your purifiers, is two-tenths (2-10) inches.

The amount of gas purified, per bushel of lime used to this date, is six thousand five hundred and fifty six (6,556) cubic feet.

Respectfully yours,
JAMES H. ARMINGTON, Supt.

BOSTON GAS-LIGHT CO., Dec. 1871.

Dear Sir: In answer to your inquiry how we like your Patent Tray for dry gas purifiers, I take pleasure in saying we have used them exclusive of all others, for the last three years, and think them far ahead of any yet offered. The surface being nearly three times that of any other Tray, and their lightness and durability perfectly satisfactory.

Yours respectfully,
A. M. GILES.

EDWARD DUFFEE, Esq.

EAST BOSTON, JUNE 15, 1871.

Gentlemen: We have used your Screens some five years. They give perfect satisfaction.

I consider them *by far the best Screen* for Dry Lime Purifiers I have seen. Yours truly, A. M. NORTON, Supt.

CHELSEA, May 1, 1871.

Mr. E. DUFFEE.

We are using your Purifying Trays, and find them to be the *best of any* that I have used, and will *purify more gas with less pressure* than any tray that I know. I can fully recommend them, after four years trial, to any Gas Superintendent with perfect safety, as the *cheapest and best Tray made.*

Yours truly, JOHN ANDREW, Sup't.

DORCHESTER, March 3, 1870.

Mr. E. DUFFEE.

Dear Sir: We have had your Gas Trays in constant use for almost one year and six months and find them superior to any others we have ever used, both in point of economy and efficiency. Truly yours, W. B. BROOKS,
Agent Dorchester Gas-Light Co.

JAMAICA PLAINS, MASS., June 21, 1871.

EDWARD DUFFEE, ESQ.

Dear Sir; The Trays ordered by this company three years ago, are getting somewhat worn. I wish to say here that I consider your Trays to be superior to any yet invented, therefore please make us another set at the price named, to be like the sample shown in every way, and oblige Yours truly
JAMES F. ROGERS,
Sup't Jamaica Plains Gas-Light Co.

BROOKLINE, June 11, 1871.

E. DUFFEE, ESQ.

Dear Sir: You will please make a set of Gas Trays for this company as soon as convenient, at price named. In regard to the merits of the Tray, after having them in constant use for over two years, I will say that I consider them *superior to any Tray* manufactured in this country. Respectfully yours,
H. A. ALLYN,
Sup't Brookline Gas-Light Co.

BANGOR, August 2, 1870

EDWARD DUFFEE, ESQ.

Dear Sir: Yours of the 20th ult. is received. In regard to your Gas Trays, I take pleasure in saying that they have been in use over two years, and have given perfect satisfaction and they are in good order at the present time; should have no hesitation in recommending them, believing they are the most durable and easiest kept in order of any with which I am acquainted. Respectfully yours,
W. H. PERRY, Sup't.

OFFICE OF THE SPRINGFIELD GAS-LIGHT CO.
SPRINGFIELD, MASS., Oct. 10, 1871.

Mr. WARD,
President Hartford Gas-Light Co.

Dear Sir: I have been using Gas Screens made by the American Gas Screen Company, for nearly a year, and find them superior in every way to the wooden Screens made and formerly used by the Springfield Gas-Light Co. I can purify more gas with the same quantity of lime, there being more surface to the Screens; and I consider them more durable, and recommend them to your consideration.

Yours with great respect,
GEORGE I WRIGHT

ROXBURY, June 14, 1872.

EDW. DUFFEE, ESQ.

Dear Sir: In answer to your inquiry regarding your Patent Gas Screens, I am happy to be able to say, that after nearly three years constant use we are perfectly satisfied with them being able to purify over fifty per cent. more gas with them than with any other Screen we have used.

Yours respectfully,
THOMAS J. PERROU

OFFICE DETROIT GAS-LIGHT CO.,
DETROIT, MICH., April 22, 1872.

AMERICAN GAS SCREEN MANUFACTURING CO., HAVERHILL.

Gentlemen: The Screens bought of you work far better than any we have ever used. As a proof, we have with the same quantity of lime purified *twenty per cent.* more gas with your Screens than with any others, and the work well done. The workmen are also better pleased with them—they being light and handy to work. They also relieve the pressure very much upon the retorts, and I cheerfully give you my experience.

Yours truly,
P. E. DEMILL, Secretary.

We give a list of some Gas-Light Companies using them.

Providence, R. I. Gas-Light Co., Boston, Mass. Gas-Light Co.: East Boston, Mass., Gas-Light Co.; South Boston, Mass. Gas-Light Co.; Springfield, Mass., Gas-Light Co.; New Bedford, Mass., Gas-Light Co.; Manchester, N. H., Gas-Light Co.; Reading, Penn., Gas-Light Co.; Biddeford, Me., Gas-Light Co.; Hartford, Conn., Gas-Light Co.: New Haven, Conn., Gas-Light Co.; New Orleans, La., Gas-Light Co.; Savannah, Ga., Gas-Light Co.; Charleston, S. C., Gas-Light Co.; Trenton, N. J., Gas-Light Co.; Charlestown, Mass., Gas-Light Co.; Dorchester, Mass., Gas-Light Co.; Chelsea, Mass., Gas-Light Co.; Baltimore, Md., Gas-Light Co.; Manhattan, N. Y., Gas-Light Co.; Cincinnati, Ohio.; Gas-Light Co.: San Francisco, Cal., Gas-Light Co.: Albany, N. Y., Gas-Light Co.; Sacramento, Cal.; St. Joseph, Mo., Gas-Light Co.; Leavenworth, Kansas, Gas-Light Co.; Macon, Ga., Gas-Light Co.; Roxbury, Mass., Gas-Light Co.; Lansinghburg, N. Y., Gas-Light Co.; Bridgeport, Conn., Gas-Light Co.; Stamford, Conn., Gas-Light Co.; Poughkeepsie, N. Y., Gas-Light Co; Scranton, Penn., Gas-Light Co.; Lewiston, Me., Gas-Light Co., and one hundred others.

Address **R. A. POTTER, Treas.,**
Amer. Gas Screen Man'f'g Co., Haverhill, Mass.

EDWARD DUFFEE, Agent.

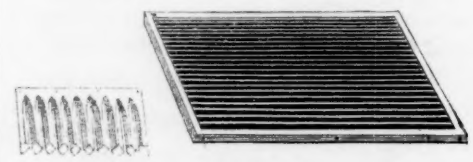
J. L. CHEESMAN.

MANUFACTURER OF

Patent Conically and Diamond Slotted

SOLID WOOD TRAYS.

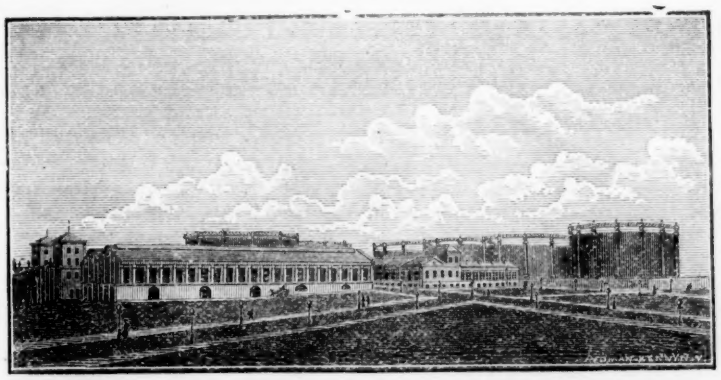
PATENTED OCTOBER 21, 1862 AND JUNE 10, 1873.



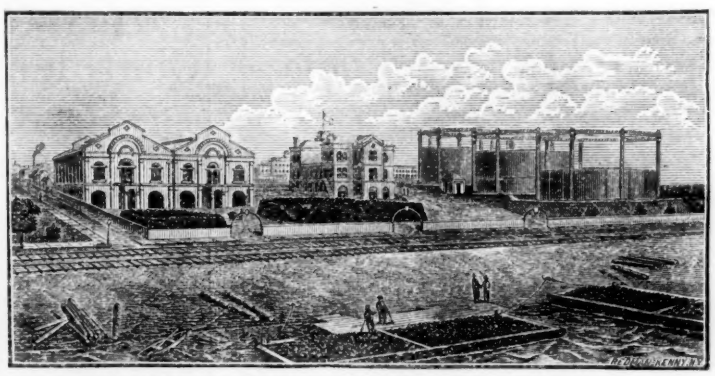
To Gas Companies.

The above Trays will last longer, and are cheaper than any Tray now used. They are now made without any outside strips, which gives more purifying surface, being perfectly smooth. The lime will not adhere to them as in other Trays. They are now used in over three hundred Gas Companies in the United States, and other places.

JOHN L. CHEESMAN,
151 and 153 Avenue C, New York.



CINCINNATI GAS WORKS, ERECTED 1871-72-73.—WM. FARMER, ENG.



LACLEDE GAS WORKS, ERECTED 1872.—WM. FARMER, ENG

WILLIAM FARMER,

ARCHITECT AND GENERAL GAS ENGINEER,

111 BROADWAY, TRINITY BUILDING, Room 95, New York.

WILLIAM FARMER may be consulted upon all matters connected with the construction of GAS WORKS, or any other description of buildings Will furnish General and Detail Drawings, Specifications and Estimates for Gas Works of any capacity.

PATENTEE OF THE FOLLOWING INVENTIONS:

Exhausters for Gas and Foul Lime Ventilation,
Dumping Barrows for Coal, Coke and Lime,
Hydraulic Mains for Retort Benches,
Blowers for Forges, Foundries, &c.
Pumps for Water, &c., &c.

REFERENCES:

Professor SILLIMAN, New Haven, Conn.
GEN. CHAS. ROOME, President Manhattan Gas-Light Company, N. Y.
A. W. BENSON, President Brooklyn Gas-Light Company, Brooklyn, N. Y.
W. W. SCARBOROUGH, President Cincinnati Gas-Light Company, Cincinnati, Ohio.
S. L. HUSTED, President Laclede Gas-Light Company, St. Louis, Mo.
Prof. HENRY WURTZ, Editor AMERICAN GAS-LIGHT JOURNAL, N. Y.
GEN. A. HICKENLOOPER, Vice-President Cincinnati Gas-Light Co., Cincinnati, Ohio.
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GAS PURIFICATION.

St. John and Cartwright's
NEW IRON COMPOSITION

Has purified, per bushel, on a single test, 10,000 feet of Westmoreland Gas. With revivification lasts indefinitely. Surpasses in POWER and ECONOMY all known materials. Saves largely in FIRST COST, SPACE, LABOR, SUPERINTENDENCE, and all current expenses. Will purify *easily* sulphurous gas, wholly *unmanageable by lime.* Takes out *all the ammonia.* Now operating in the following Gas Works: Harlem New York (21st street); Port Morris; Hunter's Point; East New York Worcester, Lynn and Cambridge, Mass.; Lewiston, Maine; St, Albans, Vt.; Pawtucket, R. I.; Meriden, Ct.; and being introduced in many other places.

Cost 70 cents per bushel. One bushel for each square foot of Purifier sufficient. Rights to use for life of Patents, for daily makes of gas in thousands; under 25,000 $200; under 50,000, $400; under 100,000, $500; $250 additional for each additional 50,000 per day.

For further information and instructions, apply to
ST. JOHN & CARTWRIGHT,
21st Street and Avenue A, New York Gas Works.

☞ Immediate arrangements are urged, as the demand for the prepared composition is increasing *so rapidly* that delays in supply may occur.

B. S, BENSON.

MANUFACTURER OF

Cast Iron Pipes and Fittings,

AND

Gas and Water Mains.

All sizes from 3 to 30 inch cast vertically in 12½ feet lengths

Office & Factory 52 East Monument St.,
BALTIMORE, MD.

OHIO GAS CANNEL,
From the Sterling Colliery.

We are now prepared to place in the market, through our agents as below, a regular and unlimited supply of this valuable Cannel, for gas purposes. The analysis made in 1871 by Prof. WURTZ, Editor of this Journal, at the Laboratories of the NEW YORK GAS-LIGHT COMPANY, gave 47¼ per cent of Volatile Matter and 45 bushels to the ton of a fair quality of coke. The yield of gas was at the rate of 9,500 feet per ton of about 27 candle power. It is not highly sulphurous, can be purified by Lime, and the ash from the coke does not clinker. The above test has been fully substantiated as correct, and can confidently recommend trial of the coal.

TUTTLE & GIRTY Proprietors,
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GEO. STACEY. HENRY RANSHAW. WM. STACEY.

GEO. STACEY & CO.,

MANUFACTURERS OF SINGLE AND TELESCOPIC

GAS-HOLDERS,

AND ALL KINDS OF

Cast and Wrought Iron Work

Used in the Erection of Gas and Coal Oil Works.

Foundry on MILL STREET; Nos. 33, 35, 37 and 39.
Office and Wrought Iron Works on RAMSAY STREET Cincinnati, Ohio.

REFERENCE.

Cincinnati Gas-Light Co.	Baton Rouge, La., Gas Co.
Indianapolis Gas Co.	Saginaw, Mich., Gas Co.
Dayton, O., Gaslight Co.	Oshkosh, Wis., Gas Co.
Covington, Ky., Gas Co.	Peoria, Ill., Gas Co.
Springfield, O., Gas Co.	Quincy, Ill., Gas Co.
Terre Haute, Ind., Gas Co.	Champaign, Ills., Gas Co.
Madison, Ind., Gas Co.	Carlinville, Ill., Gas Co.
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Topeka, Kansas, Gas Co.	Hamilton, Ohio, Gas Co.
Burlington, Iowa, Gas Co.	Vicksburg, Miss., Gas Co.
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Letters in reference to Coal should be addressed to the General Office of FREEMAN BUTTS, Cleveland, Ohio. 354

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This coal yields of Gas 11,200 cubic feet per ton of 2,240 lbs. and has an Illuminating Power of 16.30 st. candles. 350-3m

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MINED IN TAYLOR COUNTY, WEST VA.

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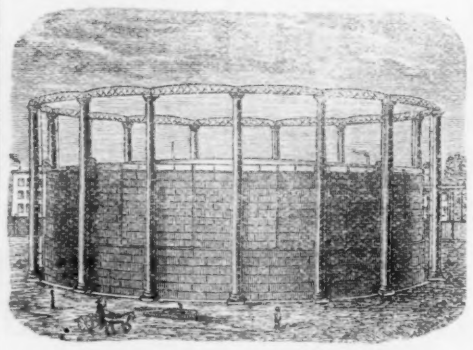

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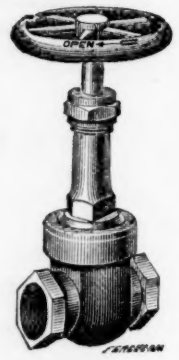

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This process has been fully tested nearly 50,000,000 cubic feet of Gas having been made under it, and fully demonstrating the fact that it is the greatest improvement ever made in the manufacture of Gas, either for Lighting or Heating purposes. With half a ton of Anthracite Coal 150,000 cubic feet of Gas per day is made from three benches, and the labor is so small that one man can attend three or four benches.

The process can be put into either Coal or Oil Gas Works (or where both Coal and Oil are used) at small cost, without any interruption to the working of other benches. The Citizens Gas-Light Company of Brooklyn, after using it for more than seven months, have found it not only far better, but actually *cheaper* than atmospheric air in making Gas, with the use of "petroleum and its products."

Further information, and terms of sale of rights will be given, upon application to the Company. 348-1

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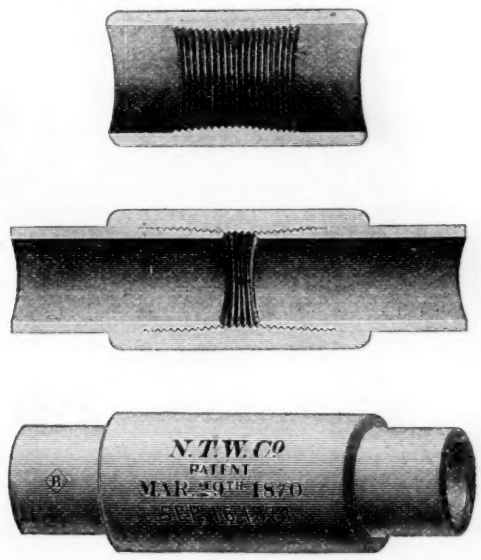
Patent Sleeve or Protecting Couplings.



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ARE PREPARED TO SUPPLY THEIR

Gas Coal and Cannel

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The **Gas Coal** (Red Bank Orrel) is specially adapted to **Gas Manufacture,** its yield being as large as that of any Caking Coal in the market, of easy purification and good illuminating power.

The Cannel is superior to any of the Ohio Cannels, obtainable and can be delivered in any required quantity, from one car and upwards. For particulars as to price, etc., apply to

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And Every Description of

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Company's Office, 29 South street, }

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*** Reference to them is requested. 204-1y

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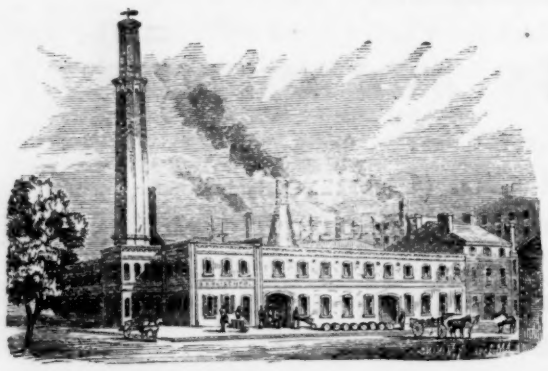

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